REMARKS

In the non-final Office Action, the Examiner rejected the pending claims based on a number of rejections under 35 U.S.C. § 103. More specifically, claims 1-5, 16, 17, 19-21, 23, and 27 were rejected under 35 U.S.C. § 103(a) based on U.S. Patent No. 6,687,220 to Ayres ("Ayres") in view of U.S. Patent Application Publication 2002/0198974 to Shafer ("Shafer"); claims 8-14 were rejected under 35 U.S.C. § 103(a) based on U.S. Patent Publication 2002/0099849 to Alfieri et al. ("Alfieri") in view of Shafer; claims 1 and 2 were rejected under 35 U.S.C. § 103(a) based on U.S. Patent Publication 2002/0062344 to Ylonen et al. ("Ylonen") in view of Shafer; and claims 6, 22, and 24-26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ayres and Shafer and further in view of Alfieri. For the reasons stated below, Applicant respectfully disagrees with these rejections.[1]

Claims 1-6, 8-14, 16, 17, and 19-27 are currently pending.

Claims 1-5, 16, 17, 19-21, 23, and 27 stand rejected under 35 U.S.C. § 103(a) based on Ayres and Shafer. For the following reasons, Applicant respectfully traverses this rejection.

Claim 1 is directed to a routing system that includes a plurality of routing resources including logic resources and physical resources. Additionally, the routing

---

1 1 As Applicant's remarks with respect to the Examiner's rejections are sufficient to overcome these rejections, Applicant's silence as to assertions by the Examiner in the Office Action or certain requirements that may be applicable to such rejections (e.g., whether a reference constitutes prior art, motivation to combine references, etc.) is not a concession by Applicant that such assertions/requirements are accurate or such requirements have been met, and Applicant reserves the right to analyze and dispute these assertions/requirements in the future.

system includes a plurality of virtual routers configured to share the routing resources in accordance with a programmably modifiable resource sharing configuration.

The Examiner contends that Ayres discloses a plurality of routing resources and a plurality of virtual routers, but concedes that Ayres does not disclose that the virtual routers are configured to share the routing resources in accordance with a programmably modifiable resource sharing configuration. (Office Action, page 2). For this feature, the Examiner relies on Shafer.

Ayres is directed to quality of service management in a router having multiple virtual router instances. (Ayres, Title). Although Ayres generally discusses virtual routers, Ayres does not appear to be particularly concerned with how resources are allocated to the virtual routers, much less disclose or suggest virtual routers that share routing resources in accordance with a programmably modifiable resource sharing configuration, as recited in claim 1. Applicant submits that Shafer does not cure this admitted deficiency in Ayres.

Shafer discloses a network router management interface. (Shafer, Title). The management interface of Shafer offers different presentation modes for viewing configuration and operation information encoded in extensible markup language obtained from a network router. (Shafer, Abstract). Shafer, however, does not disclose or suggest that the disclosed interface can be used to configure virtual routers to share routing resources in accordance with a programmably modifiable resource sharing configuration.

As described in paragraph 0004 of Shafer, router management interfaces may be used to configure a number of options relating to the operation of a router. However,

none of the router management operations described in paragraph 0004 of Shafer, or described elsewhere in Shafer, relate to the configuration of virtual routers to share routing resources in accordance with a programmably modifiable resource sharing configuration, as recited in claim 1. In contrast, the management interface described by Shafer appears to be an interface for interacting with the conventional configurations options provided by a router.

To summarize the above discussion, Applicant submits that neither Ayres nor Shafer disclose or suggest virtual routers that share routing resources in accordance with a programmably modifiable resource sharing configuration, as recited in claim 1. Ayres generally discloses virtual routers, but not virtual routers that share routing resources as recited in claim 1. Shafer discloses a router management interface, but Shafer does not disclose using the router management interface to configure virtual routers to share routing resources in the manner recited in claim 1.

Further, assuming, for the sake of argument, that one of ordinary skill in the art were to combine Ayres and Shafer, the likely result would not disclose or suggest each of the features of claim 1. Instead, the combination would likely include the management interface of Shafer used to configure the routers of Ayres using possible router configuration options described by Shafer and Ayres. As previously discussed, the possible router configuration options described by Shafer and Ayres, do not include virtual routers that share routing resources in accordance with a programmably modifiable resource sharing configuration, as recited by claim 1.

For at least these reasons, Applicant submits that Ayres and Shafer, either alone or in combination, do not disclose or suggest each of the features of claim 1. Therefore, the rejection of claim 1 based on Ayres and Shafer is improper and should be withdrawn. The rejection of claims 2-5 is also improper, at least by virtue of the dependency of these claims from claim 1.[2]

Additionally, claims 2-5 recite additional features that are not disclosed or suggested by Ayres or Shafer, either alone or in combination. Claim 5, for example, further defines the shared routing resources recited in claim 1. Specifically, claim 5 recites that the routing resources include routing processes, forwarding processes, control resources, and data resources. The Examiner relies on Ayres to allegedly disclose these features of claim 5. (Office Action, page 3). Definitions of these resources are given in the pending specification at, for example, paragraphs [0038] through [0041]. Although Ayres generally discusses virtual routers, Ayres does not appear to be particularly concerned with how resources are allocated to the virtual routers, much less that the shared routing resources include the particular resources recited in claim 5.

In rejecting claim 5, the Examiner points to various physical components in the system described by Ayres. (Office Action, page 3). In particular, the Examiner points to the claimed routing processes as being disclosed by element 40 of Ayres and the forwarding processes being disclosed by the CPU of Ayres. Element 40 of Ayres refers

---

2 As Applicant's remarks with respect to the base independent claims are sufficient to overcome the Examiner's rejections of all claims dependent therefrom, Applicant's silence as to the Examiner's assertions with respect to dependent claims is not a concession by Applicant to the Examiner's assertions as to these claims, and Applicant reserves the right to analyze and dispute these assertions in the future.

to a communication interface. (Ayres, col. 4, lines 62 and 63). A CPU and a communication interface do not disclose or suggest the routing processes and forwarding processes recited in claim 5. As consistently used and defined by the specification, the routing processes and forwarding processes refer to logical resources of the router. (see Spec., paragraph [0037]).

Accordingly, for at least these reasons also, Applicant submits that this rejection of claim 5 is improper and should be withdrawn.

Independent claim 16 and its dependent claims 17 and 19-21 also stand rejected under 35 U.S.C. § 103(a) based on Ayres and Shafer. Applicant respectfully traverses this rejection.

Claim 16 is directed to a method that includes allocating a first set of resources as shared resources and allocating a second set of resources as non-shared resources. The method further includes implementing a plurality of virtual routers based on a sharing of resources from the first set of resources between the virtual routers and based on independently assigning resources of the second set of resources to each of the virtual routers, wherein the resources included in the first set of resources and the resources included in the second set of resources are user programmable.

Ayres and Shafer, either alone or in combination, do not disclose or suggest each of the features recited in claim 16. Ayres, for example, does not disclose or suggest implementing a plurality of virtual routers based on a sharing of resources from the first set of resources between the virtual routers and based on independently assigning resources of the second set of resources to each of the virtual routers, wherein the

resources included in the first set of resources and the resources included in the second set of resources are user programmable. In the Office Action, the Examiner concedes that "Ayres does not disclose that resources are user programmable." (Office Action, page 4). For this aspect of claim 16, the Examiner relies on Shafer. (Office Action, page 4).

As previously mentioned, Shafer discloses a network router management interface that offers different presentation modes for viewing configuration and operation information. Shafer, however, does not disclose or suggest that the disclosed interface can be used to implement virtual routers in which the resources are independently assigned as recited in claim 16 and wherein resources included in a first set of resources and resources included in the second set of resources are user programmable, as is also recited in claim 16.

The router management interfaces of Shafer may be used to configure a number of options relating to the operation of a router. (See Shafer, paragraph 0004). However, none of the router management operations described in Shafer relate to assigning resources to virtual routers as recited in claim 16, wherein resources included in a first set of resources and resources included in the second set of resources are user programmable. In contrast, the management interface described by Shafer appears to be an improved interface for interacting with the conventional configuration options provided by a router.

Further, assuming, for the sake of argument, that one of ordinary skill in the art were to combine Ayres and Shafer, the likely result would not disclose or suggest each the features of claim 16. Instead, the combination would likely include the management interface of Shafer used to configure the routers of Ayres using the possible router

configuration options described by Shafer and Ayres. The possible router configuration options described by Shafer and Ayres, however, do not disclose or suggest that resources included in a first set of resources and resources included in a second set of resources are user programmable, as recited in claim 16.

For at least these reasons, Applicant submits that Ayres and Shafer, either alone or in combination, do not disclose or suggest each of the features of claim 16. Therefore, the rejection of claim 16 based on Ayres and Shafer is improper and should be withdrawn. The rejection of claims 17 and 19-21 is also improper, at least by virtue of the dependency of these claims from claim 16.

Independent claim 23 and its dependent claim 27 also stand rejected under 35 U.S.C. § 103(a) based on Ayres and Shafer. Applicant respectfully traverses this rejection.

Claim 23 is of different scope, but includes certain features similar to those recited in claims 1 and 16. Claim 23, recites, for example, "means for running a plurality of virtual routers that share, based on a user programmable configuration, ones of the means for performing routing processes, the means for performing forwarding processes, the means for implementing control resources, and the means for implementing data resources." (emphasis added). Based on rationale similar to that given above regarding claims 1 and 16, Applicant submits that Ayres and Shafer, either alone or in combination, do not disclose or suggest this feature of claim 23.

Accordingly, the rejection of claim 23 is improper and should be withdrawn. The rejection of claim 27 should also be withdrawn, at least by virtue of its dependency on claim 23.

Claims 8-14 stand rejected under 35 U.S.C. § 103(a) based on Alfieri and Shafer. Applicant respectfully traverses this rejection.

Claim 8 is directed to a network point-of-presence (POP) including a physical router system having a plurality of resources; at least one backbone router implemented as a virtual router by the physical router system; and at least one regional router implemented as a virtual router by the physical router system. The backbone virtual router and the regional virtual router share resources of the physical router system. The resources that are shared between the backbone virtual router and the regional virtual router are modifiable by a user.

In rejecting claim 8, the Examiner contends that Alfieri discloses many of the features recited in claim 8 but concedes that Alfieri "does not expressly disclose resources that modifiable by a user." (Office Action, page 7). The Examiner contends that Shafer discloses this feature of claim 8. (Office Action, page 8).

Alfieri discloses a dense virtual packet switching system including a memory divided into context areas for a set of virtual private routed networks (VPRNs). (Alfieri, Abstract). Alfieri is similar to Ayres in that both discloses virtual routers. However, in Alfieri, as with Ayres, the resources that Alfieri uses to implement the virtual routers appears to be predetermined (i.e., fixed). Alfieri does not disclose or suggest that the resources that are shared between routers are modifiable by a user, as is recited in claim 8.

Applicant submits that Shafer does not cure the deficiencies of Alfieri. As previously mentioned, Shafer discloses a network router management interface that offers different presentation modes for viewing configuration and operation information. Shafer, however, does not disclose or suggest that the disclosed interface can be used to modify resources that are shared between virtual routers, much less to modify resources that are shared between a backbone virtual router and a regional virtual router, as recited in claim 8.

As previously discussed, the router management interfaces of Shafer may be used to configure a number of options relating to the operation of a router. However, none of the router management operations described in Shafer relate to modifying resources that are shared between virtual routers, as recited in claim 8. In contrast, the management interface described by Shafer appears to be an improved interface for interacting with the conventional configurations options provided by a router.

For at least these reasons, Applicant submits that Alfieri and Shafer, either alone or in combination, do not disclose or suggest each of the features of claim 8. Therefore, the rejection of claim 8 based on Alfieri and Shafer is improper and should be withdrawn. The rejection of claims 9-14 based on Alfieri and Shafer should also be withdrawn, at least by virtue of the dependency of these claims on claim 8.

Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) based on Ylonen and Shafer. For the following reasons, Applicant respectfully traverses this rejection.

In rejecting claims 1 and 2 based on Ylonen, the Examiner points to Fig. 1b and paragraph [0004] of Ylonen as disclosing multiple virtual routers 110-112 implemented

by a processor 116. (Office Action, page 9). The Examiner concedes, however, that "Ylonen fails to disclose resources that are programmably modifiable." (Office Action, page 9).

Ylonen generally discusses the concept of virtual routers. Paragraph [0004] of Ylonen states:

> Recently, the concept of virtual routers has been introduced, as in FIG. 1b. A virtual router 110, 111 or 112 is a logical concept instead of a physical one. A single physical computing device 113 in a network may house a number of virtual routers that use the same hardware, i.e. the same physical input lines 114 and output lines 115 (which may again physically be the same as the input lines) and the same processor 116. Conceptually the virtual routers are separate entities, and a suitable multiple access scheme is applied to share the common physical resources between them. It is even possible to construct a virtual network where the connections between hosts go through virtual routers. Multiple virtual networks may rely on the same cabling and the same physical routers without having any knowledge of each other. This is a popular way of implementing virtual private networks or VPNs, each of which can serve for example as the backbone network connecting the branch offices of a large company together.

(Ylonen, paragraph [0004]). Neither this section of Ylonen, nor any other section of Ylonen, however, discloses or suggests, as is recited in claim 1, a routing system comprising a plurality of routing resources and a plurality of virtual routers configured to share the routing resources in accordance with a programmably modifiable resource sharing configuration. Applicant submits that Shafer does not cure this admitted deficiency in Ylonen.

Shafer discloses a network router management interface. (Shafer, Title). The management interface of Shafer offers different presentation modes for viewing

configuration and operation information encoded in extensible markup language obtained from a network router. (Shafer, Abstract). Shafer, however, does not disclose or suggest that the disclosed interface can be used to configure virtual routers to share routing resources in accordance with a programmably modifiable resource sharing configuration.

As described in paragraph 0004 of Shafer, router management interfaces may be used to configure a number of options relating to the operation of a router. However, none of the router management operations described in paragraph 0004 of Shafer, or described elsewhere in Shafer, relate to the configuration of virtual routers to share routing resources in accordance with a programmably modifiable resource sharing configuration, as recited in claim 1. In contrast, the management interface described by Shafer appears to be an interface for interacting with the conventional configurations provided options provided by a router.

Accordingly, applicant submits that neither Ylonen nor Shafer disclose or suggest virtual routers that share routing resources in accordance with a programmably modifiable resource sharing configuration, as recited in claim 1. Ylonen disclose virtual routers, but not virtual routers that share routing resources as recited in claim 1. Shafer discloses a router management interface, but Shafer does not disclose using the router management interface to configure virtual routers to share routing resources in the manner recited in claim 1.

Further, assuming, for the sake of argument, that one of ordinary skill in the art were to combine Ylonen and Shafer, the likely result would not disclose or suggest each of the features of claim 1. Instead, the combination would likely include the management

interface of Shafer used to configure the routers of Ylonen using possible router configuration options described by Shafer and Ylonen. The possible router configuration options described by Shafer and Ylonen, however, do not disclose or suggest configuring virtual routers to share routing resources in accordance with a programmably modifiable resource sharing configuration, as recited by claim 1.

For at least these reasons, Applicant submits that Ylonen and Shafer, either alone or in combination, do not disclose or suggest each of the features of claim 1. Therefore, the rejection of claim 1 based on Ylonen and Shafer is improper and should be withdrawn. The rejection of claim 2 based on Ylonen and Shafer is also improper, at least by virtue of the dependency of this claim from claim 1.

Claims 6, 22, and 24-26 stand rejected under 35 U.S.C. § 103(a) based on Ayres, Shafer, and Alfieri. For the following reason, Applicant respectfully traverses this rejection.

Applicant submits that Alfieri does not cure the above-noted deficiency of Ayres and Shafer regarding independent claims 1, 16, or 23, respectively. Thus, Ayres, Shafer, and Alfieri, either alone or in combination, do not disclose or suggest each of the features recited in claims 6, 22, and 24-26. Accordingly, the rejection of claims 6, 22, and 24-26 based on Ayres, Shafer, and Alfieri is improper and should be withdrawn.

In view of the foregoing amendments and remarks, Applicant respectfully requests the Examiner's reconsideration of this application, and the timely allowance of the pending claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

HARRITY SNYDER, L.L.P.

By: /Brian E. Ledell/
Brian E. Ledell
Registration No. 42,784

Date: October 5, 2006

11350 Random Hills Road
Suite 600
Fairfax, Virginia 22030
(571) 432-0800